

Claims

What is claimed is:

1 1. A computer-implemented method for unconscious data retrieval, com-
2 prising:

3 extracting at least one query key from a primary document;

4 querying at least one data source with the at least one query key;

5 receiving at least one query result from at least one data source;

6 evaluating the received at least one query result; and

7 displaying at least one received query result;

8 wherein extracting, querying, receiving, and evaluating are performed
9 without user interaction.

1 2. The method of claim 1, further comprising, prior to extracting:

2 receiving the primary document;

3 and wherein extracting, querying, receiving, and evaluating are per-

4 formed in response to receiving the primary document.

1 3. The method of claim 1, further comprising, prior to extracting:

2 accessing the primary document;

FOOTNOTES

3 and wherein extracting, querying, receiving, and evaluating are per-
4 formed in response to accessing the primary document.

1 4. The method of claim 1, further comprising, prior to extracting:
2 displaying the primary document;

3 and wherein extracting, querying, receiving, and evaluating are per-
4 formed in response to displaying the primary document.

1 5. The method of claim 1, wherein the primary document comprises an
2 electronic communication.

1 6. The method of claim 5, wherein the primary document comprises an e-
2 mail message.

1 7. The method of claim 5, further comprising, prior to extracting:
2 receiving the electronic communication;

3 and wherein extracting, querying, receiving, and evaluating are per-
4 formed in response to receiving the electronic communication.

1 8. The method of claim 7, wherein receiving the electronic communication
2 comprises receiving the electronic communication at an e-mail server.

1 9. The method of claim 7, wherein receiving the electronic communication
2 comprises receiving the electronic communication at a user's computer.

1 10. The method of claim 7, wherein receiving the electronic communica-
2 tion comprises retrieving the electronic communication from an e-mail server to
3 a user's computer.

1 11. The method of claim 1, wherein extracting, querying, receiving, and
2 evaluating are performed asynchronously with respect to user interaction with
3 the primary document.

1 12. The method of claim 1, further comprising:

2 storing the evaluated at least one query result;

3 and wherein displaying at least one received query result comprises:

4 retrieving the stored at least one query result; and

5 displaying the retrieved at least one query result.

1 13. The method of claim 1, further comprising:

2 storing the evaluated at least one query result;

3 and wherein displaying at least one received query result comprises:

4 receiving a query request from a user;

5 displaying a preview of at least one query result item responsive to the re-
6 ceived query request;
7 receiving a selection of one of the previewed items;
8 retrieving the selected item; and
9 displaying a representation of the selected item.

1 14. The method of claim 13, wherein retrieving the selected item com-
2 prises retrieving the item from a cache.

1 15. The method of claim 13, wherein retrieving the selected item com-
2 prises retrieving a text version of the item from a cache.

1 16. The method of claim 13, wherein retrieving the selected item com-
2 prises asynchronously retrieving the selected item.

1 17. The method of claim 16, further comprising:
2 notifying the user upon completion of the asynchronous retrieval of the
3 selected item.

1 18. The method of claim 1, wherein querying at least one data source
2 comprises transmitting a query over a network.

1 19. The method of claim 1, wherein querying at least one data source
2 comprises transmitting an e-mail message containing a query to the at least one
3 data source.

1 20. The method of claim 1, wherein querying at least one data source
2 comprises transmitting across a firewall an e-mail message containing a query to
3 the at least one data source.

1 21. The method of claim 1, wherein querying at least one data source
2 comprises transmitting an XML-encoded e-mail message containing a query to
3 the at least one data source.

1 22. The method of claim 1, wherein receiving at least one query result
2 from at least one data source comprises receiving an e-mail message containing
3 at least one query result from at least one data source.

1 23. The method of claim 1, wherein receiving at least one query result
2 from at least one data source comprises receiving an XML-encoded e-mail mes-
3 sage containing at least one query result from at least one data source.

1 24. The method of claim 1, wherein the at least one data source comprises
2 at least one information appliance.

1 25. The method of claim 24, wherein at least one of the information appli-
2 ances comprises one selected from the group consisting of:

- 3 a visitor kiosk;
4 a meeting recorder;
5 a presentation recorder;
6 a whiteboard capture device;
7 a communication device; and
8 a document management device.

1 26. The method of claim 1, wherein evaluating the received at least one
2 query result comprises estimating the relevance of the query result with respect
3 to the primary document.

1 27. The method of claim 1, wherein evaluating the received at least one
2 query result comprises determining whether the query result has previously
3 been displayed.

1 28. The method of claim 1, wherein evaluating the received at least one
2 query result comprises determining whether the query result is sufficiently rele-
3 vant with respect to a predetermined relevancy threshold;

4 and wherein displaying at least one received query result comprises dis-
5 playing a query result responsive to the determination indicating that the query
6 result is sufficiently relevant.

1 29. The method of claim 1, wherein displaying at least one received query
2 result comprises determining displaying at least one received query result in a
3 sequence prioritized according to estimated relevance.

1 30. The method of claim 1, further comprising:

2 after receiving at least one query result, determining whether an addi-
3 tional query should be performed;

4 responsive to a determination that an additional query should be per-
5 formed:

6 formulating an additional query containing at least one secondary
7 query key;

8 querying at least one data source with the at least one secondary
9 query key;

10 receiving at least one secondary query result from at least one data
11 source; and

12 displaying at least one received secondary query result;

1 31. The method of claim 30, wherein formulating an additional query
2 comprises formulating an additional query comprising at least one query key
3 from the primary document and at least one secondary query key.

1 32. The method of claim 1, wherein displaying at least one received query
2 result comprises displaying the query result in the context of a currently active
3 software application.

1 33. The method of claim 1, wherein displaying at least one received query
2 result comprises displaying the query result in a sidebar pane adjacent to a cur-
3 rently active on-screen window.

1 34. The method of claim 1, wherein displaying at least one received query
2 result comprises displaying the query result in an on-screen window concur-
3 rently with display of a currently active on-screen window.

1 35. The method of claim 1, wherein displaying at least one received query
2 result comprises displaying the query result in an on-screen dialog box.

1 36. The method of claim 1, wherein at least a portion of the displayed
2 query result comprises a hyperlink to a resource containing data related to the
3 displayed query result.

1 37. The method of claim 1, wherein the at least one received query result
2 comprises a plurality of query results, the method further comprising:
3 prioritizing the query results according to estimated relevance;
4 and wherein displaying at least one received query result comprises dis-
5 playing a plurality of query results in order of priority.

1 38. The method of claim 37, wherein prioritizing the query results is per-
2 formed responsive to the context of the query results.

1 39. The method of claim 37, wherein prioritizing the query results is per-
2 formed responsive to the context of the query key in the primary document.

1 40. The method of claim 1, wherein at least one of the data sources com-
2 prises a network-connected computer containing shared information.

1 41. The method of claim 1, wherein at least one of the data sources com-
2 prises a shared directory.

1 42. The method of claim 1, wherein at least one of the data sources is in-
2 termittently connected via a network.

1 43. The method of claim 1, wherein the primary document is one selected
2 from the group consisting of:

3 an electronic communication;
4 a word processing document;
5 a spreadsheet document;
6 a task item;
7 a calendar item;
8 a file;
9 an image;
10 a sound recording;
11 a video recording; and
12 a contact record.

1 44. The method of claim 1, wherein querying at least one data source
2 comprises:
3 formulating a structured query based on the extracted at least one query
4 key; and
5 transmitting the structured query to the at least one data source.

1 45. The method of claim 1, wherein extracting at least one query key
2 comprises applying a part-of-speech analysis to the primary document.

1 46. The method of claim 1, further comprising:
2 selecting at least one data source based on the extracted at least one query
3 key;

4 and wherein querying at least one data source comprises querying the se-
5 lected at least one data source.

1 47. The method of claim 1, wherein evaluating the received at least one
2 query result comprises applying a Bayesian belief net to determine estimated
3 relevance of the at least one query result.

1 48. The method of claim 1, wherein displaying at least one received query
2 result comprises displaying the result on a device that is intermittently connected
3 via a network.

1 49. The method of claim 48, wherein the device comprises a portable com-
2 puting device.

1 50. The method of claim 1, wherein the primary document comprises a
2 text document.

1 51. The method of claim 1, wherein the primary document comprises a
2 non-text document.

1 52. The method of claim 1, wherein querying at least one data source
2 comprises transmitting a text query.

1 53. The method of claim 1, wherein querying at least one data source
2 comprises transmitting a non-text query.

3 displaying a menu comprising at least one command; and
4 responsive to user selection of one of the at least one command, display-
5 ing a query result.

1 60. The method of claim 1, wherein displaying at least one received query
2 result comprises:

3 displaying a menu activation icon;
4 responsive to user activation of the menu activation icon, displaying a
5 menu comprising at least one command; and
6 responsive to user selection of one of the at least one command, display-
7 ing a query result.

1 61. The method of claim 1, wherein displaying at least one received query
2 result comprises:

3 recognizing user-entered text as having a format corresponding to a pre-
4 defined data type;
5 displaying a menu comprising at least one command applicable to the
6 data type; and
7 responsive to user selection of one of the at least one command, display-
8 ing a query result.

1 62. A computer-implemented system for unconscious data retrieval, com-
2 prising:

3 a receiver, for receiving a primary document;
4 a requester, coupled to the receiver, for generating and transmitting to at
5 least one data source at least one query related to the primary
6 document;
7 an evaluator, for receiving at least one query result from the at least one
8 data source and for evaluating the received at least one query
9 result; and
10 a display, coupled to the evaluator, for displaying the at least one received
11 query result;
12 wherein the receiver, the requester, and the evaluator operate without
13 user interaction.

1 63. The system of claim 62, wherein the primary document comprises an
2 electronic communication.

1 64. The system of claim 63, wherein the primary document comprises an
2 e-mail message.

1 65. The system of claim 64, wherein the receiver comprises an e-mail
2 server.

1 66. The system of claim 64, wherein the receiver comprises an e-mail pro-
2 gram running on a user's computer.

1 67. The system of claim 62, wherein the requester and the evaluator oper-
2 ate asynchronously with respect to user interaction with the primary document.

1 68. The system of claim 62, further comprising:
2 a storage device, coupled to the evaluator, for storing the evaluated at
3 least one query result;

4 and wherein the display displays at least one received query result re-
5 trieved from the storage device.

1 69. The system of claim 62, further comprising:
2 a storage device, coupled to the evaluator, for storing the evaluated at
3 least one query result; and
4 an input device for receiving a query request from a user;
5 and wherein the display further displays a query preview interface show-
6 ing at least one query result item responsive to the received query request, and,
7 responsive to a selection of one of the previewed items, displays a representation
8 of the selected item.

1 70. The system of claim 69, wherein:
2 the storage device comprises a cache; and
3 the at least one query result item is retrieved from the cache.

1 71. The system of claim 69, wherein:
2 the storage device comprises a text cache; and
3 the representation of the at least one query result item is retrieved from
4 the text cache.

1 72. The system of claim 69, wherein:
2 the requester generates and transmits to at least one data source a request
3 for the selected item; and
4 the receiver receives the selected item asynchronously.

1 73. The system of claim 72, further comprising:
2 a notifier, coupled to the receiver, for notifying the user upon completion
3 of the asynchronous retrieval of the selected item.

1 74. The system of claim 62, wherein the requester transmits the query
2 over a network.

1 75. The system of claim 62, wherein the requester transmits an e-mail
2 message containing a query to the at least one data source.

1 76. The system of claim 62, wherein the requester transmits across a fire-
2 wall an e-mail message containing a query to the at least one data source.

1 77. The system of claim 62, wherein the evaluator receives an e-mail mes-
2 sage containing at least one query result from at least one data source.

1 78. The system of claim 62, wherein the at least one data source comprises
2 at least one information appliance.

1 79. The system of claim 78, wherein at least one of the information appli-
2 ances comprises one selected from the group consisting of:

3 a visitor kiosk;
4 a meeting recorder;
5 a presentation recorder;
6 a whiteboard capture device;
7 a communication device; and
8 a document management device.

1 80. The system of claim 62, wherein the evaluator estimates the relevance
2 of the query result with respect to the primary document.

1 81. The system of claim 62, wherein the evaluator determines whether the
2 query result is sufficiently relevant with respect to a predetermined relevancy
3 threshold;

4 and wherein the display displays a query result responsive to the deter-
5 mination indicating that the query result is sufficiently relevant.

1 82. The system of claim 62, wherein the display displays at least one re-
2 ceived query result in a sequence prioritized according to estimated relevance.

1 83. The system of claim 62, wherein the display displays the query result
2 in the context of a currently active software application.

1 84. The system of claim 62, wherein the display comprises a sidebar pane
2 adjacent to a currently active on-screen window.

1 85. The system of claim 62, wherein the display comprises an on-screen
2 window shown concurrently with a currently active on-screen window.

1 86. The system of claim 62, wherein the display comprises an on-screen
2 dialog box.

1 87. The system of claim 62, wherein at least a portion of the displayed
2 query result comprises a hyperlink to a resource containing data related to the
3 displayed query result.

1 88. The system of claim 62, wherein at least one of the data sources com-
2 prises a network-connected computer containing shared information.

1 89. The system of claim 62, wherein at least one of the data sources com-
2 prises a shared directory.

1 90. The system of claim 62, wherein at least one of the data sources is in-
2 termittently connected via a network.

1 91. The system of claim 62, wherein the primary document is one selected
2 from the group consisting of:

3 an electronic communication;

4 a word processing document;

5 a spreadsheet document;

6 a task item;

7 a calendar item;

8 a file;

9 an image;

10 a sound recording;

11 a video recording; and

12 a contact record.

1 92. The system of claim 62, wherein the requester comprises:

2 a query formulator, for formulating a structured query based on the ex-

3 tracted at least one query key; and

4 a transmitter, coupled to the query formulator, for transmitting the struc-
5 tured query to the at least one data source.

1 93. The system of claim 62, wherein the evaluator applies a Bayesian be-
2 lief net to determine estimated relevance of the at least one query result.

1 94. The system of claim 62, wherein the display comprises a portable com-
2 puting device.

1 95. The system of claim 62, wherein the primary document comprises a
2 text document.

1 96. The system of claim 62, wherein the primary document comprises a
2 non-text document.

1 97. The system of claim 62, wherein the display comprises a calendar dis-
2 play.

1 98. The system of claim 62, wherein the display comprises a user-
2 activated toolbar menu.

1 99. A computer program product comprising a computer-usable medium
2 having computer-readable code embodied therein for unconscious data retrieval,
3 comprising:

4 computer-readable program code configured to cause a computer to ex-
5 tract at least one query key from a primary document;
6 computer-readable program code configured to cause a computer to
7 query at least one data source with the at least one query key;
8 computer-readable program code configured to cause a computer to re-
9 ceive at least one query result from at least one data source;
10 computer-readable program code configured to cause a computer to
11 evaluate the received at least one query result; and
12 computer-readable program code configured to cause a computer to dis-
13 play at least one received query result;

14 wherein the computer-readable program code configured to cause a com-
15 puter to extract, query, receive, and evaluate operate without user interaction.

1 100. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to extract, query, receive,
3 and evaluate operate asynchronously with respect to user interaction with the
4 primary document.

1 101. The computer program product of claim 99, further comprising:
2 computer-readable program code configured to cause a computer to store
3 the evaluated at least one query result;

4 and wherein the computer-readable program code configured to cause a
5 computer to display at least one received query result comprises:

6 computer-readable program code configured to cause a computer to re-
7 trieve the stored at least one query result; and

8 computer-readable program code configured to cause a computer to dis-
9 play the retrieved at least one query result.

1 102. The computer program product of claim 99, further comprising:

2 computer-readable program code configured to cause a computer to store
3 the evaluated at least one query result;

4 and wherein the computer-readable program code configured to cause a
5 computer to display at least one received query result comprises:

6 computer-readable program code configured to cause a computer to re-
7 ceive a query request from a user;

8 computer-readable program code configured to cause a computer to dis-
9 play a preview of at least one query result item responsive to
10 the received query request;

11 computer-readable program code configured to cause a computer to re-
12 ceive a selection of one of the previewed items;

13 computer-readable program code configured to cause a computer to re-
14 trieve the selected item; and

15 computer-readable program code configured to cause a computer to dis-
16 play a representation of the selected item.

1 103. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to query at least one data
3 source comprises computer-readable program code configured to cause a com-
4 puter to transmit a query over a network.

1 104. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to query at least one data
3 source comprises computer-readable program code configured to cause a com-
4 puter to transmit an e-mail message containing a query to the at least one data
5 source.

1 105. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to query at least one data
3 source comprises computer-readable program code configured to cause a com-
4 puter to transmit across a firewall an e-mail message containing a query to the at
5 least one data source.

1 106. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to query at least one data
3 source comprises computer-readable program code configured to cause a com-

puter to transmit an XML-encoded e-mail message containing a query to the at
least one data source.

107. The computer program product of claim 99, wherein the computer-
readable program code configured to cause a computer to receive at least one
query result from at least one data source comprises computer-readable program
code configured to cause a computer to receive an e-mail message containing at
least one query result from at least one data source.

108. The computer program product of claim 99, wherein the at least one
data source comprises at least one information appliance.

109. The computer program product of claim 108, wherein at least one of
the information appliances comprises one selected from the group consisting of:

- a visitor kiosk;
- a meeting recorder;
- a presentation recorder;
- a whiteboard capture device;
- a communication device; and
- a document management device.

110. The computer program product of claim 99, wherein the computer-
readable program code configured to cause a computer to evaluate the received

3 at least one query result comprises computer-readable program code configured
4 to cause a computer to estimate the relevance of the query result with respect to
5 the primary document.

1 111. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to evaluate the received
3 at least one query result comprises computer-readable program code configured
4 to cause a computer to determine whether the query result is sufficiently relevant
5 with respect to a predetermined relevancy threshold;

6 and wherein the computer-readable program code configured to cause a
7 computer to display at least one received query result comprises computer-
8 readable program code configured to cause a computer to display a query result
9 responsive to the determination indicating that the query result is sufficiently
10 relevant.

1 112. The computer program product of claim 99, further comprising:
2 computer-readable program code configured to cause a computer to, after
3 receiving at least one query result, determine whether an addi-
4 tional query should be performed;
5 computer-readable program code configured to cause a computer to, re-
6 sponsive to a determination that an additional query should be
7 performed:

8 formulate an additional query containing at least one secondary
9 query key;
10 query at least one data source with the at least one secondary query
11 key;
12 receive at least one secondary query result from at least one data
13 source; and
14 display at least one received secondary query result;

1 113. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to
4 cause a computer to display the query result in the context of a currently active
5 software application.

1 114. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to
4 cause a computer to display the query result in a sidebar pane adjacent to a cur-
5 rently active on-screen window.

1 115. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to

4 cause a computer to display the query result in an on-screen window concur-
5 rently with display of a currently active on-screen window.

1 116. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to
4 cause a computer to display the query result in an on-screen dialog box.

1 117. The computer program product of claim 99, wherein at least one of
2 the data sources comprises a network-connected computer containing shared in-
3 formation.

1 118. The computer program product of claim 99, wherein at least one of
2 the data sources comprises a shared directory.

1 119. The computer program product of claim 99, wherein the primary
2 document is one selected from the group consisting of:

- 3 an electronic communication;
- 4 a word processing document;
- 5 a spreadsheet document;
- 6 a task item;
- 7 a calendar item;
- 8 a file;

9 an image;
10 a sound recording;
11 a video recording; and
12 a contact record.

1 120. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to query at least one data
3 source comprises:

4 computer-readable program code configured to cause a computer to for-
5 mulate a structured query based on the extracted at least one
6 query key; and
7 computer-readable program code configured to cause a computer to
8 transmit the structured query to the at least one data source.

1 121. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to extract at least one
3 query key comprises computer-readable program code configured to cause a
4 computer to apply a part-of-speech analysis to the primary document.

1 122. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to evaluate the received
3 at least one query result comprises computer-readable program code configured

4 to cause a computer to apply a Bayesian belief net to determine estimated rele-
5 vance of the at least one query result.

1 123. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to
4 cause a computer to display the result on a device that is intermittently con-
5 nected via a network.

1 124. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to
4 cause a computer to display the query result in a calendar display.

1 125. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises computer-readable program code configured to
4 cause a computer to display the query result in a user-activated toolbar menu.

1 126. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises:

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4 computer-readable program code configured to cause a computer to des-
5 ignate at least a portion of the primary document as a hyperlink;
6 and
7 computer-readable program code configured to cause a computer to, re-
8 sponsive to user activation of the hyperlink, display a query re-
9 sult.

1 127. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises:
4 computer-readable program code configured to cause a computer to dis-
5 play an on-screen button; and
6 computer-readable program code configured to cause a computer to, re-
7 sponsive to user activation of the button, display a query result.

1 128. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises:
4 computer-readable program code configured to cause a computer to dis-
5 play a toolbar menu activation button; and
6 computer-readable program code configured to cause a computer to, re-
7 sponsive to user activation of the button, display a query result.

1 129. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises:

4 computer-readable program code configured to cause a computer to dis-
5 play a menu comprising at least one command; and
6 computer-readable program code configured to cause a computer to, re-
7 sponsive to user selection of one of the at least one command,
8 display a query result.

1 130. The computer program product of claim 99, wherein the computer-
2 readable program code configured to cause a computer to display at least one
3 received query result comprises:

4 computer-readable program code configured to cause a computer to dis-
5 play a menu activation icon;
6 computer-readable program code configured to cause a computer to, re-
7 sponsive to user activation of the menu activation icon, display
8 a menu comprising at least one command; and
9 computer-readable program code configured to cause a computer to, re-
10 sponsive to user selection of one of the at least one command,
11 display a query result.

